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PATENT APPLICATION
FOR:

AN APPARATUS, SYSTEM, METHOD AND COMPUTER PROGRAM PRODUCT FOR CREATING SHORTCUTS TO FUNCTIONS IN A PERSONAL COMMUNICATION DEVICE

INVENTORS:

Jyri Engestrom
Marko Ahtisaari
Jyrki Hoisko

Morgan & Finnegan, L.L.P
345 Park Avenue
New York, New York 10154-0053
(212) 758-4800
(202) 857-7887

Attorneys for Applicants

AN APPARATUS, SYSTEM, METHOD AND COMPUTER PROGRAM PRODUCT FOR CREATING SHORTCUTS TO FUNCTIONS IN A PERSONAL COMMUNICATION DEVICE

FIELD OF THE INVENTION

[0001] The present invention is directed generally to the integration of machine-readable tags and tag readers with a personal communication device to improve device functionality.

BACKGROUND OF THE INVENTION

[0002] Personal communication devices have become ubiquitous in every day life not only for busy adults but for young people as well. Additionally, the demand for increased functions performed by such devices has also increased. Thus, it is not enough to just perform more functions quickly. It is equally important to perform functions that are more relevant to the user. The more personalized the functions, the more useful the personal communication device becomes.

[0003] One method of improving the efficiency of receiving information is by using RF tagging systems, more particularly RFID wireless systems. The RFID wireless systems use RFID labels known as tags or transponders that can contain varying amounts of information, and a controller unit usually referred to as a reader or interrogator. RFID interrogators communicate with the tags through the use of radio frequency (RF) energy. RFID wireless network principles are described in a publication entitled "Radio Frequency Identification: A

Basic Primer," published by the Automatic Identification Manufacturers (AIM) web site (http://www.aimglobal.org), October 23, 2001 and fully incorporated herein by reference.

[0004] Most recently, the use of RFID systems in personal communication devices have been proposed for improving device functionality. However, none of the proposed systems adequately allow for personalizing functions in a personal communication device when an RFID tag is scanned by an RFID reader. More specifically, with the known systems it is not possible to select or create a shortcut to functions in a personal communication device when a signal from an RFID tag is received.

[0005] Thus, it would be desirable to provide an apparatus, system, method and computer program product for creating shortcuts to functions in a personal communication device using RF tagging systems, such as, for example an RFID system.

SUMMARY OF THE INVENTION

[0006] To overcome limitations in the prior art described above, and to overcome other limitations that will be apparent upon reading and understanding the present application, an apparatus, system, method and computer program product for creating shortcuts to functions in a personal communication device are proposed.

[0007] The apparatus and system of the present invention include a personal communication device with an RFID tag reader, at least one RFID tag, a memory location, at least one shortcut stored in the memory location and a processor for processing the shortcut and prompting the selection or creation of a new shortcut. More specifically, the personal communication device is a cellular telephone, a satellite telephone, a personal digital

assistant or a Bluetooth device. The RFID tags are active or passive and provide at least RFID information to the RIFD reader when the personal communication device is proximate to an RFID tag. Additionally, the RFID tags can be programmable and have the ability of being write-protected.

[0008] Shortcuts include RFID tag information, a command for selecting an application program and a wrapper that defines the format and properties of a shortcut (e.g., XML or SMIL). Additionally, the shortcuts when executed can be used to activate a personal command, macro or script when the personal communication device receives the tag information. The shortcut can be stored in a memory location in the personal communication, RFID tag or network server. The shortcuts can also be shared with other devices by sending a shortcut or part of it over a Bluetooth, cellular or other carrier, or by publishing the same on a public network for access by other devices.

[0009] It is also contemplated by the invention that the system includes a network connection for communication between the public network and the personal communication device. The network connection can be a wireless connection using a wireless protocol for transmitting data to and receiving data from the personal communication device. For example, the network connection may use GSM, WAP EDGE, UMTS or other similar wireless mobile telephone network protocol.

[0010] The method of the present invention includes receiving and decoding the RFID tag information using the RFID tag reader in the personal communication device. Upon receipt of the RFID information, the processor can execute a preset shortcut stored in a

memory, or in the alternative prompt a user to select or create a new shortcut to be stored in the memory. Once executed, the shortcut initiates at least one function of the personal communication device identified by the shortcut. At least part of the shortcut can be determined by the user of a personal communication, therefore, the same RFID information can be used to control different functions in different personal communication devices. For example, RFID information from one tag can be used to send a text message from one device and take a photo in another device.

[0011] The computer program product of the present invention includes a computer readable medium with executable code for receiving and decoding the RFID tag information as well as for executing the preset shortcut based on the received RFID tag information. Executable program code is provided for the selection and creation of a new shortcut, and for selecting and executing a function in the personal communication device based on the shortcut. It is also contemplated by the invention that the computer program product further comprises program code for storing a shortcut in a memory location regardless of whether the memory is in the personal communication device, the RFID tag or the network server. The computer program product further includes program code for establishing and maintaining the network connection to a public network for communication between a network server and the personal communication device as well as communicating to other devices using a wireless protocol (e.g., MMS or Bluetooth) or connecting to the Internet.

[0012] It is contemplated by the invention that the selection and creation of shortcuts can also be prioritized for more efficient use of network resources. For example, upon receiving RF information, the personal communication device may first scan a memory in the RFID

tag, then scan a memory in the personal communication device, and then scan a memory of a network server for a shortcut that corresponds to received RFID tag information.

[0013] Additionally, although the use of RFID systems has been disclosed herein, other types of RF tagging systems are believed to be compatible with the present invention as described above. Moreover, it is contemplated that RFID tags can also be replaced with other machine-readable data such as barcodes, which can be used to then program various functions of a personal communication device. Communication between a barcode and the personal communication device can be achieved by a camera function in the device that takes a picture of the barcode. The barcode can then be decoded and processed by the personal communication device for executing a function.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The accompanying figures best illustrate the details of an apparatus, system, method and computer program product for creating shortcuts to functions in a personal communication device. Like reference numbers and designations in these figures refer to like elements.

[0015] Fig. 1 is a system diagram in accordance with an embodiment of the present invention.

[0016] Fig. 2 is a detailed diagram of a shortcut in accordance with an embodiment of the present invention.

[0017] Fig. 3 illustrates a method of using and creating a shortcut in a personal communication device in accordance with an embodiment of the present invention.

[0018] Fig. 4 illustrates a system for using a shortcut in a personal communication device in accordance with an embodiment of the present invention.

[0019] Fig. 5 illustrates a system for creating a shortcut in a personal communication device in accordance with an embodiment of the present invention.

[0020] Figs. 6A & 6B illustrate in more detail an exemplary user interface for using a personal shortcut in a personal communication device in accordance with an embodiment of the present invention.

[0021] Figs. 7 illustrates in more detail an exemplary user interface for creating a personal shortcut in a personal communication device in accordance with an embodiment of the present invention.

[0022] Fig. 8 illustrates a method of creating a shortcut in an RFID tag in accordance with an embodiment of the present invention.

[0023] Fig. 9 illustrates a system for using a shortcut in an RFID tag in accordance with an embodiment of the present invention.

[0024] Fig. 10 illustrates a system for creating a shortcut in an RFID tag in accordance with an embodiment of the present invention.

[0025] Fig. 11 illustrates a method of using and creating a public shortcut in accordance with an embodiment of the present invention.

[0026] Fig. 12 illustrates a system for using a public shortcut in accordance with an embodiment of the present invention.

[0027] Fig. 13 illustrates a system for creating a public shortcut in accordance with an embodiment of the present invention.

[0028] Fig. 14 illustrates a method of prioritizing resources for selecting and creating shortcuts in accordance with an embodiment of the present invention.

[0029] Fig. 15 illustrates the use of machine-readable data in accordance with an embodiment of the present invention.

[0030] Fig. 16 illustrates a method of using machine-readable data for selecting and creating a shortcut in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0031] In the following description of the various embodiments, reference is made to the accompanying drawings, which form a part hereof, and in which is shown by way of illustration various embodiments in which the invention may be practiced.

[0032] Fig. 1 illustrates a system in accordance with an embodiment of the present invention. In Fig. 1, the system, for simplicity, includes two personal communication devices **1** in communication with a radio frequency identification (RFID) tag **2** via a wireless communication channel **5**. It is contemplated by the invention that the RFID tag **2** is passive or active and emits a wireless RF signal. As illustrated in Fig. 1, both the personal communication devices **1** and the RFID tag **2** include several internal components that are essential to their operation.

[0033] The RFID tag **2** includes a central processor **3**, a memory **7** and an antenna **6**. Additionally, the RFID tag **2** can also include an optional power supply **8** depending on

whether the tag **2** is active or passive. The central processor **3** enables the RFID tag **2** to execute instructions for the transmission, reception and storage of data. The memory **7** may comprise read-only (ROM), random access (RAM) and non-volatile programmable memory that can be write-protected depending on the type and sophistication of the RFID tag **2**. A simple RFID tag may be capable of storing data between 16 and 200 bits while a more complex RFID tag may be able to store at least tens of kilobytes of data. It is contemplated by the invention that the RFID tag **2** used could be, for example, the type manufactured by Innovision, Gemplus or Philips Mifare. One or more RFID tags **2** can be placed in locations and on objects that are pertinent to a user or a plurality of users of personal communication devices **1**. For example, it is possible that an RFID tag **2** is integrated with another personal communication device **1** for executing functions on two or more devices **1** as users come in contact with each other. The antenna **6** enables the RFID tag **2** to transmit and receive the wireless communications from the personal communication devices **1**. The range of transmission of an RFID tag **2** will vary depending on its sophistication and the application.

[0034] The personal communication device **1** can be a cellular telephone, a satellite telephone, a personal digital assistant or a Bluetooth device. The personal communication device **1** includes a tag reader module **13**, an internal memory **9**, a processor **10**, an operating system **11**, application programs **12**, a display **14**, a user interface **15**, a persistent memory **16** and a network interface **18**. The tag reader module **13** also includes an antenna and decoder (not shown). The antenna **6** enables RF wireless signals to be transmitted to and received from the personal communication device **1**. The decoder reads the data in the signal received from the tag **2** and forwards the information to the internal memory **9**. The internal memory **9**

accommodates the processor **10**, operating system **11** and application programs **12** and the persistent memory **16**. The personal communication device **1** may further include an RFID tag (not shown), which allows other devices **1** to communicate with the device **1** through the RFID interface. It is also contemplated in one embodiment of the present invention that the RFID readers **13** can establish a direct communication interface between the devices **1**. According to yet another embodiment, the RFID reader module **13** may include a dedicated transponder logic (not shown) that enables the reader module **13** to act as an RFID tag **2** in a transponder operation mode, as described in PCT Application No. PCT/1B03/02900 "Reader Device For Radio Frequency Identification Transponder With Transponder Functionality" filed on July 11, 2003 by the Applicant and fully incorporated herein by reference.

[0035] The processor **10** executes instructions for the reception, transmission, storage and display of data. The operating system **11** enables the execution of the application programs **12** that control various functions of the personal communication device **1**. The persistent memory **16** provides storage protection for data that a user deems critical or sensitive. The user is able to communicate with the personal communication device **1** via the user interface **15**. The user interface **15** can be a keyboard, keypad, touch screen or similar user interface for inputting user instructions or otherwise communicating with the personal communication device **1**. Communication between the internal components of the personal communication device **1** is achieved via a bus **17**, which provides as a common point of electrical connection for all the internal components of the device **1**. The communication between the RFID tag **2** and the personal communication device **1** is achieved when the personal communication

device **1** comes within the proper range of the RFID tag **2**, which, as stated previously, will vary depending on the sophistication of the RFID system.

[0036] The network interface **18** enables communication between the personal communication device **1** and a network or another wireless device. The network interface **18** may conform to Bluetooth standard protocols or other wireless LAN standard protocols such as, but in no way limited to, shared wireless access protocol (SWAP), Wireless Personal Area Network (WPAN) protocol, High Performance Radio Local Area Network (HIPERLAN) protocol, or Multimedia Mobile Access Communication (MMAC) protocol. The network interface **18** can also be used to connect with any ordinary mobile telephone connection such as e.g. GSM, WAP EDGE, UMTS, or any similar connection.

[0037] Fig. 2 illustrates in more detail a shortcut in accordance with an embodiment of the present invention. It is contemplated by the invention that there are generally three types of shortcuts that will be used by the personal communication device to control functions: 1) personal shortcuts; 2) preset shortcuts; and 3) public shortcuts. These three types of shortcuts will be discussed in more detail in the figures that follow. For simplicity, Fig. 2 will discuss shortcuts in general.

[0038] In Fig. 2, the shortcut **19** has three elements:1) the tag registration or ID **22**; 2) a description or information regarding a personal command, macro or script **23**; and 3) a wrapper **20** that defines the format and properties of the data contained in the RFID tag **2** (e.g., XML/SMIL). Each shortcut **19** is related to an application **12** for controlling a particular function of the personal communication device **1**. A user can personalize the

shortcuts **19** so that each RFID tag registration or ID **22** is associated with a different desired application **12** and function in the personal communication device **1**.

[0039] The following are examples of applications that can be initiated by a shortcut:

1) A tag triggers a macro that makes a phone call. E.g. an RFID tag is placed in a picture frame. To this end, pictures of family members can perform a phone book function. The handicapped and elderly could use this application effectively.
2) A tag triggers a macro that sends a predefined SMS to a company database. For example, a maintenance person indicates his appearance to the maintenance site by swiping the tag.
3) A plurality of tags trigger macros for making calendar entries, differing based on the tag that is triggered. For example, one tag may represent "arrival" and another "departure" and so on. Thus, a user can keep track of his/her use of time.
4) A tag triggers the opening of a WAP connection and access to an electronic newspaper. The tag may reside in a cafeteria or at a user's office, so that during a coffee break, the user may catch up on current events.
5) A tag triggers a macro that changes settings or tools in a device, e.g. from changing from "Ring" mode to "Silent" mode. These tags could be very useful in meeting rooms for example.
6) A tag triggers updates to "presence" information via SMS or SIP message. E.g. a tag represents "At Office." Persons in a buddy list may then see this change. The change of presence is semi-automatic; the user is required to initiate the change, but everything else is carried out automatically without the need for a single key press.

7) A tag triggers a macro that activates a call divert-mode "on".

8) A tag triggers a macro that sends a predefined/stored SMS message to some service, e.g. in order to retrieve phone account balance information or weather forecasts.

9) A tag triggers a macro for displaying a common work project between coworkers, e.g. touching coworkers' personal communication devices **1** leads to triggering applications to open common work projects or documents, or the like. The RFID tag is placed on coworkers' personal communication devices.

[0040] The command or macro **23** included in the shortcut **19** may be written in Java Script, Perl, Visual Basic, Python or in some other scripting language. It can also be a binary program that is Operating System Independent (e.g. Java) or dependent on the microprocessor of the system (e.g. Binary executables for certain device using certain microprocessor running, e.g. Symbian OS).

[0041] The macro may also comprise an operating system dependent UID (user interface Identification Code) codes that the operating system uses to pass on information and commands in the system, e.g. Opening of certain menus, keyboard input, user selections etc. E.g. In Symbian Operating System, the Macro could include UID codes such as EeikCmdFileOpen or EeikCmdIrdaSend, which are used to carry out a specific function in the program or even to launch programs.

[0042] The macro can also contain keycodes, such as EkeyOK, EaknSoftkeyBack, EkeyRightArrow and EkeyMenu (these are used in Symbian OS), which are generated and passed on in the system when a user interface (UI) is used. Thus, the macro mimics the actions of the user as if the user him/herself had used the UI. The most simplistic use of

macro would be to store a program name and a parameter in the macro, e.g. webbrowser http:\\www.internet.com\http_parameters, which would launch a web-browser, feed it with stored URL as a parameter from where the desired content eventually is loaded.

[0043] Fig. 3 illustrates a method of creating and using a personal shortcut in accordance with an embodiment of the present invention. In step **S1**, RFID tag information is received by the RFID reader **13** of the personal communication device **1** via the RF channel **5**. The RFID tag information includes at least a tag registration or ID **22**. The RFID tag information (e.g. registration or ID) is decoded by the RFID reader **13** and is forwarded to the processor **10**. In this case, the personal shortcut **19** that corresponds to the RFID information is stored in the internal memory **9** of the personal communication device **1**. Accordingly, in step **S2**, the processor **10** determines if a shortcut **19** corresponding to the RFID tag information can be found in the internal memory **9**. If a shortcut **19** is found, then the processor **10** continues to step **S6** and executes the command, macro or script **23** in the shortcut **19**. On the other hand, if the processor **10** cannot find a shortcut **19** (step **S3**), then in step **S4** the processor **10** prompts the user to either select or create another shortcut **19**. The processor **10**, in step **S5** then saves the new shortcut **19** in the internal memory **9** for future use by the personal communication device **1**. In step **S6**, the processor **10** executes the command, macro or script **23** of the shortcut **19**.

[0044] The user can define a personal shortcut **19** for any particular RFID tag **2**. This means that a certain RFID tag **2** can correspond to different shortcuts **19** in different personal communication devices **1**. E.g. a first user can use an RFID tag to change a device to a

"Silent" mode, while another user can use the same RFID tag to program his device to fetch a WAP-page containing today's lunch menu.

[0045] Figs. 4 & 5 provide systems for using and creating a personal shortcut in accordance with the method described in Fig. 3. In Fig. 4, the system illustrates how a personal shortcut **19** is used while in Fig. 5, the system illustrates how a new personal shortcut **19** is selected or created. In Figs. 4, the RFID tag **2** is sending RFID tag information to the personal communication device **1** and the information is received by the RFID reader **13** of the personal communication device **1**. The RFID reader **13** decodes the RF signal and sends the decoded RFID tag information to the processor **10**. In this embodiment, the RFID tag information includes an RFID tag registration or ID **22** that is used to identify a particular RFID tag **2**. However, the RFID tag **2** can also transmit more data if desired. The processor **10** searches the persistent memory **16** in the internal memory **9** of the personal communication device **1** for a corresponding command **23**. The command **23** is then retrieved from the persistent memory **16** and executed by the processor **10**. The command **23** is used to select and initiate application software or programs **12** in the personal communication device **1** to control a particular device function such as, but not limited to, displaying data, sending an e-mail, making a call, taking a photo, accessing the Internet or other similar functions.

[0046] In Fig. 5, it is contemplated that the processor **10** was unable to find a corresponding shortcut **19** for the RFID information received by the personal communication device **1**. In this case, the processor **10** prompts the user to either select a new command or create a command. Accordingly, the user can select a command **23** from any available

shortcut **23** stored in the internal memory **9** or create a new shortcut **19** that can be subsequently stored in the internal memory **9** of the personal communication device **1**. In any case, the user communicates with the personal communication device **1** using the user interface **15** and display **14**. If a new shortcut is created, the processor **10** will store the shortcut in the persistent memory **16**.

[0047] Figs. 6A & 6B illustrate in more detail the user interface for using a personal shortcut in a personal communication device consistent with the systems described in Figs 4 & 5. In Fig. 6A, the user **25** has a personal communication device **1** and initiates communication with an RFID tag **2** placed at a particular location. In this case, communication between the RFID tag **2** and the personal communication device **1** is initiated upon touching the personal communication device **1** to the RFID tag **1**. Shortly after initiation of the communication session, the user interface (UI) **15** in the display **14** of the personal communication device **1** indicates the existence of a shortcut **19** in the personal communication device **1** for the RFID tag **2**. The UI **15** indicates that the shortcut triggers a call to a friend named "Sandy"(i.e., "Calling Sandy").

[0048] In Fig. 6B, upon initiation of the communication session between the personal communication device **1** and the RFID tag **2**, the device **1** confirms the RFID tag information received and prompts the user **25** to make a selection. Specifically, the user **25** is prompted to make a selection between two shortcuts **19** related to the RFID tag **2**: 1) one related to a phone call; and 2) the other related to a web page. Once a selection is made by the user **25**, the UI **15** of the personal communication device indicate the execution of the selected

shortcut **19**. In this case, the selected shortcut is related to a phone call to a friend (i.e., Calling Sandy).

[0049] Fig. 7 illustrates in more detail the user interface for creating a personal shortcut in a personal communication device consistent with the system described in Figs 4 & 5.

[0050] Generally, when the user wants to create or program a new functionality, a recording macro-function is activated. The device **1** returns to a basic state (e.g. idle state). The user **25** uses the UI **15** as if it was a normal usage situation. The recorder records all the inputs the user **25** makes. The recording can be stopped for example by using a specific key or key combination. All the inputs by the user **25** are stored as being part of that macro **23** or activity shortcut **19**. Thus, when the macro **23** is run, it mimics the user inputs. Delays between user inputs can be shortened.

[0051] Alternatively, the macro recorder (not shown) can investigate the status of the operating system **11** while the user **25** is recording the macro **23** and instead of recording and later replaying key presses as such, it detects which applications **12** are being activated and what parameters are given to these applications **12**. The macro recorder can also investigate which menu commands are given and passed through the operating system **11**. Thus, in replay-phase, the macro replay system activates the same applications **12** with the same parameters as were running in the recording phase. Also, menu and other commands can be given in the same order as was given by the user during the recording phase.

[0052] The recorded macro could contain for example following commands:

<START OF MACRO>

<RFID Tag ID>#23435</RFID Tag ID>

EKeyMenu, EKeyUp, EKeyUp, EKeyOK,

<100ms pause>, EkeyOK

<Activate>WebBrowser<\Activate Parameter: http:\\www.nokia.com>

<Menu Command>MENU_COMMAND_ID_#23<\Menu Command> <Explanation:>Clear Cache<\Explanation>

<200ms pause>, EkeyOK

<END OF MACRO>

[0053] The above macro **23** could for example first mimic the user input so that the device **1** is set up in some certain state, then the macro **23** activates an application **12** and gives menu commands to the application **12** (rather than user key inputs), which would clear the cache of the web browser. After a little pause, the macro **23** would, for example, answer to a system dialog window "Are you sure you want to clear cache" by mimicking user's key press for OK option. Pauses are needed in order for the system to be able to carry out activities, e.g. display option windows etc. The macro **23** can be stored in a memory **16, 27** or in an RFID tag **2.** If the macro **23** is stored in the memory **16, 27**, there needs to be a reference in an RFID-Macro table (not shown) in the memory **16, 27** for RFID tag ID **22** to refer to a corresponding Macro/Script/binary executable location. However, the RFID information may optionally be part of the macro **23** as well.

[0054] With the above information in mind, in Fig. 7 the user **25** of the personal communication device **1** initiates a communication session with an RFID tag **2.** The personal communication device **1** then determines that there is no shortcut created for the RFID tag **2.**

Accordingly, the user **25** is prompted to create a shortcut **19** to correspond to the RFID tag **2**. The UI **15** of the device **1**, prompts the user **25** to select from various device functions that will be triggered in future communications with the RFID tag **2**. In this case, the user **25** selects a phone call function that will execute a phone call to a friend, e.g. "Sandy." The new shortcut **19** is then saved in a memory location as indicated by the display **14** of the device **1**. Using the UI **15**, the user **25** can also specify format and protocol for a particular shortcut **19** as well as make changes to shortcut information. Once the new shortcut **19** is complete, the shortcut **19** can be executed upon future communications between the RFID tag **2** and the personal communication device **1**, which will be indicated by the display **14** of the device **1**.

[0055] Fig. 8 illustrates a method of using and creating a preset shortcut that is stored in the RFID tag **2**. **1.** It is contemplated by the invention that the user has access to an RFID writer and the RFID tags **2** are programmable. Additionally, it is preferable that the user will have the option to set "programmed" tags as write-protected to ensure the integrity of the preset shortcuts **19**. A new shortcut **19** can also be selected or created in an RFID tag **2**. Selection and creation of a shortcut **19** in an RFID tag **2** will be discussed in detail in the figures that follow.

[0056] Similar to method discussed in Fig. 3, the method in Fig. 8 starts with RFID tag information being received by the RFID reader **13** of the personal communication device **1** via the channel **5** (step **S7**). In this method, however, the RFID tag information received includes a preset shortcut **19** stored in the RFID tag memory **7**. The preset shortcut **19** includes a registration or ID **22** and at least one command **23**. Once the RFID tag information is decoded, the processor **10** in step **S8** prompts the user to either use the preset

shortcut **23** stored in the RFID tag **2** or, select or create a new shortcut **19**. This preset shortcut **19** will be proposed to all users who touch or come in the range of the RFID tag **2**. Additionally, one RFID tag **2** may contain multiple preset shortcuts **19** so that after reading the RFID tag **2**, a user can select among several shortcuts **19**. In step **S9**, the user decides to use the preset shortcut **19** and in step **S13**, the processor executes the corresponding command **23** of the shortcut **19.**

[0057] In step **S8**, the user decides instead to select or create a new shortcut **19**. However, in step **S10**, the user cannot find a suitable alternate shortcut **19** in the memory **7**, so in step **S11** the user is prompted to create a new shortcut **19** to be stored in the RFID memory **7**. In step **S12**, the processor **10** stores the newly created shortcut **19** in the memory of the RFID tag, and in step **S13** the new shortcut **19** is executed by the processor **10**. It is also contemplated by the present invention that the selection and creation of shortcuts **19** can be prioritized for more efficient use of network resources, which will be discussed in more detail in Fig. 14.

[0058] Figs. 9 & 10 provide a system for using and creating a preset shortcut in an RFID tag **2** in accordance with the method described in Fig. 8. Fig. 9 illustrates a system for using the preset shortcut while Fig. 10 illustrates a system for creating the preset shortcut. In Fig. 9, the RFID tag **2** is sending RFID tag information that is received by the RFID reader **13** of the personal communication device **1**. The RFID reader **13** decodes the RF signal and sends the decoded RFID tag information to the processor **10**. In this case, the RFID tag information includes a preset shortcut **19** that includes at least an RFID ID **22** and a command **23**. The processor **10** prompts the user to select a preset shortcut **19** stored in the RFID tag **2** or create

a new shortcut via the user interface **15** and display **14**. The processor **10** will then use the corresponding command **23** in the shortcut to select and initiate application software or programs **12** in the personal communication device **1.**

[0059] Fig. 10 illustrates a similar system for creating a preset shortcut in accordance with the method described in Fig. 8. In Fig. 10, it is contemplated that the user chooses to create a new preset shortcut **19** when prompted by the processor **10**. Additionally, it is contemplated by the invention that the personal communication device **1** is equipped with an RFID tag writer (not shown) as well as an RFID reader **13**. The user creates a new preset shortcut **19** using the user interface **15** and display **14**. The processor **10** then forwards the information for the preset shortcut **19** to the RFID tag **2** via the RFID reader **13.** The new preset shortcut **19** is programmed and stored in the memory of the RFID tag **2** for future use by the personal communication device **1**.

[0060] Fig. 11 illustrates a method of using and creating a public shortcut in accordance with an embodiment of the present invention. This description will discuss only the distinguishable features between this method and the methods already discussed in Figs. 3 & 8.

[0061] In this case, after receiving the RFID information (steps **S14** & **S15**), the processor **10** searches the memory of the personal communication device **1** for a stored shortcut **19** that correspond to the received RFID tag information (steps **S16** & **S25**). In step **S17**, if no shortcut **19** can be found, the processor **10** in step **S18**, will send a query to an external memory or server **27**. The personal communication device **1** sends the RFID tag

information to a predefined address. The RFID tag **2** may contain the information, or there could be a predefined address stored in the memory **9** of the personal communication device **1**. Additionally, an identification or ID for the personal communication device **1** may also be included in the information sent to the server **27**, which enables more personalized shortcuts **19** for different devices **1**. In step **S19**, if no command **23** corresponding to the RFID tag **2** can be found in the server **27**, the user is prompted to create a new shortcut **19** in step **S21**.

[0062] The personal communication device **1** or the server **27** may initiate the prompting to create the new shortcut **19**. For example, the server will prompt the personal communication device **1** to create a shortcut **19**, or provide the device **1** with shortcut information in order to perform the preferred action. After creating the new shortcut **19**, in step **S22** the processor **10** in the personal communication device **1** sends the shortcut **19** to the server **27** for registration and storage. Once the newly created shortcut is registered, in step **S24** the user receives a message from the server **27** regarding the registration. In the alternative, if a shortcut **19** is found (step **S20**), the shortcut corresponding to the RFID tag **2** is executed in step **S25**.

[0063] Figs. 12 & 13 provide systems for using and creating a public shortcut **19** that is stored in a server in accordance with the method described in Fig.11. Fig. 12 illustrates a system for using a public shortcut while Fig. 13 illustrates a system for creating a public shortcut. The main distinction between these systems and the systems in Figs 9 & 10 is the communication between the personal communication device **1** and the server **27**. In Fig. 12, after receiving the RFID tag information, the processor **10** sends a query to the server **27** via a network interface **18**. For simplicity, the connection to the server **27** is via the Internet **25**.

The query includes at least the RFID tag information. If a corresponding shortcut **19** is found, the shortcut **19** is returned to the personal communication device **1** via the same network connection **18**.

[0064] It is also contemplated by the invention that in addition to RFID tag information some ID information relating to the device or the user is added to the request allowing one additional way for creating personalized shortcuts. This type of approach may allow also directing shortcuts to certain devices, e.g. a user of device A wants to make a shortcut to devices B's user, which is possible if the ID of the request is somehow commonly recognized.

[0065] Fig. 13 illustrates a system for creating a shortcut **19** that is stored and registered in the server **27**. In Fig. 13, the processor **10** is unable to find a corresponding shortcut **19** either in the server **27** or in the personal communication device **1**. Once prompted to create a new shortcut, the user sends the new shortcut **19** via the network connection to the server **27**. The server **27** stores and registers the shortcut **19** for use by any user having access to the network **25**.

[0066] Fig. 14 illustrates a method of prioritizing the selection and creation of shortcuts in accordance with an embodiment of the present invention. In step **S24**, the personal communication device **1** receives RF information from an RFID tag **2**. In step **S25**, the personal communication device **1** reads the tag ID **22** and searches for a corresponding preset shortcut **19**. If a preset shortcut **19** exists, then in step **S26** the user is prompted to execute the preset shortcut **19**. If the user selects the preset shortcut **19**, then in step **S27**, the preset

shortcut **19** is executed. However, in step **S26**, if the user decides to select or create a new shortcut **19**, then in step **S33** a new short cut **19** is created. In steps **S34**, the newly created shortcut **19** is stored in the RFID tag **2** for future execution in step **S27**.

[0067] In **S25**, if no shortcut is found in the RFID tag **2**, then in step **S29** the personal communication device **1** checks for a corresponding personal shortcut **19** in the memory **16** of the device **1**. If a personal short **19** exists in the memory **16**, then in step **S30** the user is prompted to select the personal shortcut **19** for execution. If the personal shortcut **19** is selected, then in step **S27**, the shortcut **19** is executed. In step **S30**, if the user decides instead to select or create a new shortcut, then in steps **S33** and **S34** the new shortcut is created and stored in the memory **16** for future execution in step **S27**.

[0068] In step **S29**, if no personal shortcut **19** exists, then in step **S31** the personal communication device **1** checks for a corresponding public shortcut **19** in the external memory **27**. If a public shortcut **19** is found, then in step **S32** the user is prompted to select the public shortcut **19** for execution in step **S27**. In step **S32**, if the user decides instead to select or create a new shortcut, then in steps **S33** and **S34**, the new shortcut is created and stored in the external memory **27** for future execution in step **S27**. The prioritization discussed above ensures that no unnecessary network resources are utilized in connection with reading machine-readable tags, such as RIFD tags.

[0069] It also contemplated in an alternative embodiment that step **S29** is performed before step **S25.** In other words, it is first determined if a corresponding shortcut **19** is stored in the device **1** memory **16** before searching the memory **7** in the RFID tag **2** for a

corresponding shortcut **19**. However, in either case, steps **S25** and **S29** are performed before **S31**.

[0070] It is also contemplated that although the use of RFID systems have been disclosed, other types of RF tagging systems are compatible with the present invention as described above.

[0071] In another embodiment it is contemplated that the present invention as described above can be used in a barcode environment. For example, RFID tags can be replaced with a barcode tag, which can be used to "program" various functions of a personal communication device. Communication between the barcode and the personal communication device can be achieved, in addition to integrating the personal communication device with a conventional barcode reader, by the use of a camera in the device that takes a picture of the barcode. The barcode can then be decoded and processed by the personal communication device. Figs. 15 and 16 illustrate the barcode environment as described above.

[0072] In Fig. 15, the user of the personal communication device **1** uses an interface **15** to take an image of a bar cod. The image is taken using an imaging device (not shown) such as a digital camera in the device **1**. The barcode **35** is place on an item or at a location pertinent to a user or plurality of users. The image of the barcode is shown in the display **14** of the device **1**.

[0073] Fig. 16, illustrates a method of selecting or creating a shortcut using machine-readable code such as barcode. In step **S35**, the imaging device in the personal communication device **1** either reads or takes an image of the barcode **35**. In step **S37**, the

processor of the personal communication device **1** decodes the barcode data and searches the memory **16** in the personal communication device **1**. If no corresponding shortcut **19** is found in the memory **16**, then in step **S38** the user is prompted to select or create a new shortcut **19**, which can be executed in step **S39**. On the other hand, in step **S37** if a corresponding shortcut **19** is found, then in step **S39**, the stored shortcut is selected and executed. It should be noted that reprogramming a barcode **35** itself by "rewriting" is not contemplated, only the aspects of programming the device memory **16**, and network location updates are contemplated by the present invention. It is also contemplated that the barcode aspect includes the use of optical codes or "2D barcodes" that can vary in color, shape and size.

[0074] In yet another embodiment it is contemplated that "local hot spots" can be implemented with the present invention as described above. For example, local hot spots transmit wireless shortcuts to proximate personal communication devices. The user of the device can then re-program the shortcuts in the device using any of the techniques herein.

[0075] Although illustrative embodiments have been described herein in detail, it should be noted and understood that the descriptions and drawings have been provided for purposes of illustration only and that other variations both in form and detail can be added thereupon without departing from the spirit and scope of the invention. The terms and expressions have been used as terms of description and not terms of limitation. There is no limitation to use the terms or expressions to exclude any equivalents of features shown and described or portions thereof.